

CATALYST CONNECTION® POWERING POTENTIAL

Southwest Pennsylvania Entry-Level Manufacturing Workforce and Training Demand Study

Powered by Catalyst Connection Sponsored by The Appalachian Regional Commission Prepared by Dr. Deborah D. Stine, President, Science, Technology, & Innovation Policy Analysis & Education, LLC





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Executive Summary

As a part of a grant initiative funded by the Appalachian Regional Commission, Catalyst Connection gathered information from manufacturing companies to identify near-term entry-level workforce and training needs. This purpose of this study is to help ensure that Catalyst Connection's efforts support the southwestern PA manufacturing community and make wise use of the taxpayer dollars that have been provided for this initiative.

Data, information, and opinions were gathered from a total of 32 small and medium sized manufacturing companies through a combination of a survey (28), interviews (15), and a focus group (13). Not all manufacturers participated in all of these information-gathering activities. Information collected focused on two categories:

- Technical Workforce Positions and Hiring Expectations
- Training Expectations and Needs

The workforce population that was the focus of this information gathering activity were entry-level workers, where entry-level is defined as those with high school degrees, high school technical/vocational education, pre- apprenticeship, or community college education but no or limited experience.

Occupation	Maximum # of Hires (2021)
Assembly Line (Production)	175
Inspectors, Testers	80
Shipping & ReCeiving	80
CNC Machinists	80
Welders & Solderers	65
General Maintenace & Repair	65
Packing & Filling Machines	55
Other	45
Customer Service Representatives	35
Technical Sales	25
Certified Production Technician	15
TOTAL	720

Technical Workforce Positions and Hiring Expectations

Finding 1: All employers surveyed are hiring, or expect to hire, entry-level manufacturing workers in 2021. Most openings are in production (e.g., assembly line, shop floor operators), shipping and receiving clerks, and general maintenance & repair, and inspectors & testers. The table to the left provides the upper-bound of the hires, by occupation, expected in 2021 by the 28 companies that responded to our survey.

In Catalyst Connection's 2018 Manufacturing Employment Demand Study, the 111 companies responding indicated that they had 1,070 to 2,300 current open positions. Of these one-third were entry-level and did not require a college degree. This 2021 analysis is of a small number of employers and only for entry- level positions. A review of the number of jobs per company in 2018 and 2021 suggests that even more entry-level workers will be hired in 2021 than in 2018.



According to the U.S. Bureau of Labor Statistics (BLS), as of April 2021 there were 77,900 manufacturing workers in the Pittsburgh Metropolitan Statistical Area (MSA), which is 3.2% more than the number of workers in April 2020 (the height of job losses caused by the pandemic), but less than 87,400 manufacturing workers in April 2019.

Finding 2: Most manufacturers are having a hard-time filling their current entry-level openings. The most common challenges in hiring including lack of qualified applicants, insufficient applicants, and competition with other manufacturers in the region for the top applicants. When turning down a job offer, the most common reasons are low wages, shift work requirements, and a better salary and benefits offer from another employer (who may or may not be a manufacturer).

The experience in Southwest Pennsylvania is similar to that at the national level. A May 2021 Deloitte study that surveyed U.S. manufactures found that "finding the right talent is now 36% harder than it was in 2018, even as the unemployment rate has nearly doubled the number of available workers." Further, "The top two consequences cited by manufacturers of not being able to fill jobs were the inability to increase revenue growth (82%) and maintain production levels to satisfy demand (81%)." In addition, "Seventy-seven percent say they will have ongoing difficulties in attracting and retaining workers in 2021 and beyond."

Finding 3: Most manufacturers (59%) pay entry-level employees in the \$15-20/hour range. This result corresponds to national data. According to the Deloitte study, "The remainder (41%) pay \$10-14/hour and some

are considering increasing their wages to attract more applicants to their open positions." No companies in our study paid less than \$10 or more than \$20 per hour. In some cases, companies in both ranges provide productivity bonuses to all employees on quarterly and/or annual basis. All provide at least health benefits, but there is variation on other benefits provided such as dental, vision, life insurance, short- term and long-term disability, and 401(k) programs.

According to the Deloitte May 2021 national analysis, "Warehouse and distribution jobs are increasingly competing for manufacturing workforce share, despite entry-level jobs in manufacturing averaging \$15.55/hour, or double the minimum federal wage, and manufacturing wages for skilled workers are even higher." As

12-month percent changes in ECI





Figure 2 from the BLS illustrates, the Employment Cost Index (ECI) which includes all employer costs including wages, benefits, supplemental pay, retirement, and insurance is increasing in the Mid-Atlantic region – above that for the United States as a whole.



Training Expectations and Needs

Finding 4: Most manufacturers indicate that an applicant needs both technical and soft skills to obtain a job offer and for long-term employment. Technical skills needed include math/measurement skills (e.g., the ability to read a tape measure), basic mechanical skills, familiarity with hand tools (e.g., hammer, electronic screwdriver), problem-solving skills (e.g., adaptive learning), and basic technical training (e.g., degree, industry certification or vocational training). Top soft skills needed are basic employability skills (e.g., attendance timeliness, work ethic) and basic communication skills (oral, written, and listening comprehension). Some of these skills are provided through pre-employment training programs such as those offered by Catalyst Connection. For those companies who may be interested in training from outside organizations (about 75%), most prefer hybrid training (mix of classroom and online) or classroom only.

Finding 5: Most employers are interested in partnering with local high schools to find applicants for entry-level openings, but find it challenging to communicate with their local high schools. They would appreciate working with Catalyst Connection's Industrial Manufacturing Technician Pre-Apprenticeship program, which most were not aware of prior to this study, as long as it did not create additional work for them such as government paperwork. The IMT pre-apprenticeship program helps high school students begin a pathway to a career in manufacturing with an online curriculum that includes safety, blueprint reading, measurement, statistical process control, and other training. Figure 3 illustrates the potential of expanding the IMT program through the Southwest Pennsylvania region.

Finding 6: For those companies who have worked with Catalyst Connection on employee training, all but one rated Catalyst Connection's training programs at level 4 (very good) or 5 (excellent) on a 5-point scale. About half of companies have diversity and inclusion statements for their hiring practices, and others indicated they were welcome to interviewing diverse applicants. Catalyst Connection's programs, pictured and described on the next two pages, provide manufacturing workforce education and support for middle school, high school, and college students as well as entry-level workers, supervisors, and management. One example is "The Making Your Future" program (see Box).

"The Making Your Future" program addresses the skilled worker shortage and the social and income disparities in Pittsburgh. During this program, individuals from underrepresented groups and disadvantaged communities in the Pittsburgh region will have the opportunity to participate in one-year of career counseling and job development services. For manufacturing companies, the program provides them with an opportunity to be "conscious capitalists" by enhancing their ties to the community while at the same time building their technical, sales & distribution, and administrative human resources. There is no financial obligation to participate in the program beyond paying the trainees and providing them with health benefits.



Figure 3: Map of Companies in Catalyst Connection Survey (in green) with regional high schools (in red).



Respondent Insights

In addition to the information above, participants provided insightful comments, such as those below:

Insight 1: Some of Catalyst Connection's current training was considered too long and would be better in smaller bites on the order of 30-45 minutes that fit better with the nature of shift work. A related comment was that some training was too generic and would be more acceptable if it was adapted to the specific work environment – for example, if the mathematics training exercises include the math activities at that specific company that they could incorporate into their new employee orientation (NEO).

Insight 2: A number of respondents indicated that they would appreciate Catalyst's help in advertising their job openings on a website and providing a list of local high school applicants in their region who were seeking employment in the manufacturing sector so they could reach out to them. Catalyst Connection does collect job postings from Indeed and posts them on its Making Your Future website.

Insight 3: Several companies indicated that their biggest training need was not for entry-level workers, but rather for employees who have risen through the ranks and are now ready to supervise others. These workers need both technical skills (such as blueprint reading) and soft skills (such as managing employees and communicating with company leadership).

Conclusion

As is the case nationally, manufacturing employment in Southwest Pennsylvania is on an upward trend as the nation recovers from the pandemic economic slump – though it has not yet quite reached pre-pandemic employment levels. We are beginning to see the same technical workforce shortages as occurred prior to the pandemic, leading to the need for higher wages so the manufacturing industry can compete not only with other manufacturers but other economic sectors. Continued support from Catalyst Connection to support the hiring needs of small- and medium-sized manufacturers through its training programs is as important today as it was prior to the pandemic.

Catalyst could bring the companies in each region to partner with high schools to offer tours of manufacturing facilities and other programming so that high school students had a better understanding of today's manufacturing employment opportunities and how they differ from those in the past. According to the Deloitte study, one of the top reasons these positions tend to go unfilled is that "new entrants lack of attraction or interest in the industry," leading to the need for more education of the younger generation about the manufacturing industry. Catalyst has a number of programs to encourage student and recent graduate interest in manufacturing positions. These include its "What's So Cool About Manufacturing" video contest that is popular with both participating manufacturers and students. Students can, with the support or regional manufacturers, continue through their interest through the IMT Pre-Apprenticeship program. High school graduates could then work through The Making Your Future program to find manufacturing jobs in their region.



PROGRAMMING & OUTREACH ECOSYSTEM





ABOUT OUR PROGRAMS



CATALYST CONNECTION

CLASSWORK

K-12 Lesson Plans

K-12 lesson plans cover multiple subject areas utilizing content from the "What's So Cool" video contest.

EVENTS

Manufacturing Day

A national and regional focus on events that addresses common misconceptions about manufacturing.

MOBILE APPS

Cube Cut

A mobile app that provides students with a fun way to explore careers in manufacturing for free.

MechLife

A mobile application that aims to prepare future candidates for typical mechanical aptitude tests that are commonly used during the hiring process.

WEBSITES

Explore the New Manufacturing

A website that gives young people, teachers, and parents a new perspective on the exciting career opportunities that exist in today's manufacturing industry.

Making Your Future

An initiative designed to help thousands of people find a career in manufacturing.

PROGRAMS

Emerging Leaders

A professional platform for helping young leaders in manufacturing achieve personal and professional growth by focusing on mission-critical topics and applied learning.

Industry 4.0 Teacher Academy

A recently piloted program designed to engage local teachers in the conversation about emerging technologies.

Manufacturing Innovation Challenge

A program that brings together the brightest minds of tomorrow's workforce with Southwestern Pennsylvania companies to engage in hands-on improvement projects.

Pre-Apprenticeship

Pathway into manufacturing careers through online classes, company tours, guest speakers and career guidance.

Teacher in the Workplace

A program that provides educators with opportunities to interact with local businesses to obtain a better understanding of in-demand careers, and the skills necessary to succeed in the workplace.

"What's So Cool" Video Contest

A middle school video contest that helps addresses the need for skilled workers in the manufacturing industry through creating awareness and changing perceptions about manufacturing companies/careers.



Career and Technical Education (CO-OP)

A structured method of combining classroom-based education with practical work experience.

Industrial Manufacturing Technician Apprenticeship

An apprenticeship that helps entrylevel workers in manufacturing quickly enhance their skills and advance with their current employer.

Internships

Internships provide an exchange of services for both a college student and a manufacturing company.

Robotics Technician Apprenticeship

A program that provides apprentices with skill-based training required in the manufacturing industry to interface with robotics, while developing a talent pool of highly skilled workers for local employers.

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Southwest Pennsylvania Entry-Level Manufacturing Workforce and Training Demand Study

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As a part of a grant initiative funded by the Appalachian Regional Commission, Catalyst Connection gathered information from manufacturing companies to identify near-term entry-level workforce and training needs. This purpose of this study is to help ensure that Catalyst Connection's efforts support the southwestern PA manufacturing community and make wise use of the taxpayer dollars that have been provided for this initiative. Information collected focused on two categories:

- Technical Workforce Positions and Hiring Expectations
- Training Expectations and Needs

The workforce population that was the focus of this information gathering activity were entry-level workers, where entry-level is defined as those with high school degrees, high school technical/vocational education, pre- apprenticeship, or community college education but no or limited experience.

This report provides information on Southwest Pennsylvania's manufacturing industry and its workforce before the pandemic and provides an outlook on the employment expectations and training needs as the pandemic winds down in 2021.

Southwest Pennsylvania (SWPA) Manufacturing Industry and Workforce

The SWPA manufacturing industry, as assessed prior to the pandemic, included 2823 manufacturing establishments employing over 91,5821 workers in 10 counties that have a total population of 2.6 million. (See Figure 4). Manufacturing was the fourth largest industry in this region, as measured by gross regional product, contributing \$131.1 billion to the economy.

According to the U.S. Bureau of Labor Statistics (BLS), as of April 2021 there were 77,900 manufacturing workers in the Pittsburgh Metropolitan Statistical Area (MSA), which is 3.2% more than the number of workers in April 2020 (the height of job losses caused by the pandemic), but less than 87,400 manufacturing workers in April 2019. Manufacturing is the fifth largest employer in the Pittsburgh MSA.



Figure 4: Demographic Information for the Southwest Pennsylvania Counties Supported by Catalyst Connection.

1 Note that the Pittsburgh MSA employment data discussed earlier is smaller than the counties served by Catalyst Connection leading to a difference in employment numbers. The Pittsburgh MSA does not include the SWPA counties of Greene, Indiana, and Lawrence. Manufacturing facilities are often in rural counties like these.



In terms of wages, the mean hourly wage for production occupations at all levels in the Pittsburgh MSA in May 2020 was \$19.58/hour, (\$44,210 annually) according to the BLS. This in in line with the national estimates for production occupations during the same time period. Pennsylvania wages are in the middle of those in the region with those in New York in the highest range, Ohio in the next lower range, and West Virginia in the same range. Note that this May 2020 data is during the midst of the pandemic, but is still useful for comparative purposes.

Results of Information and Data Collection

This study gathered data, information, and opinions on "Technical Workforce Positions and Hiring Expectations" and "Training Expectations and Needs" from a total of 32 small and medium sized manufacturing companies through a combination of a survey (28), interviews (15), and a focus group (13). Not all manufacturers participated in all of these information-gathering activities. The information summarized below provides the responses to the survey questions supplemented with additional commentary from a focus group of human resource (HR) representatives and individual interviews with some of the survey respondents which included a combination of senior management, technical leadership, and HR representatives.

Technical Workforce Positions and Hiring Expectations

The survey began by asking the 28 respondents how they currently recruit workers. As shown in Figure 5, most companies surveyed use a combination of online and employee referrals to meet their hiring needs along with a mix of other options as shown in the figure below. Several manufacturers noted that although



H1. How do you currently recruit entry-level workers? (More than one may be checked)

Figure 5: Manufacturing Company Recruitment Methods, 2021

in the past they were able to use their network of "friends and family" of employees and customers, that pool is diminishing. As a result, they are looking into alternative venues including in the case of one company, radio spots, to recruit workers.

A common issue was that even when applicants apply for jobs, it does not necessarily mean that they will respond to a request for an interview, and if they do, whether they will actually show up for the interview. The reasons for this behavior are unclear, but it can be

frustrating for manufacturers. Some manufacturers also noted that the number of applicants applying for positions in early-2021 is less than that prior to the pandemic. Demand for workers has rapidly increased in all sectors making it a very competitive market for companies interested in expanding their workforce.

The next question asked manufacturers to provide information on which entry-level positions they expected to hire for in 2021. The table to the left provides the high end of that range.



Occupation	Maximum # of Hires (2021)
Assembly Line (Production)	175
Inspectors, Testers	80
Shipping & ReCeiving	80
CNC Machinists	80
Welders & Solderers	65
General Maintenace & Repair	65
Packing & Filling Machines	55
Other	45
Customer Service Representatives	35
Technical Sales	25
Certified Production Technician	15
TOTAL	720

Figure 6: Maximum 2021 New Hire Expectations for 28 Manufacturing Companies Survey Respondents

H5. Please provide information on the typical hourly wage provided to full-time entry-level workers. 27 responses





Most openings are in production (e.g., assembly line, shop floor operators), shipping and receiving clerks, and general maintenance & repair, and inspectors & testers. The table to the left provides the upperbound of the hires, by occupation, expected in 2021 by the 28 companies that responded to our survey. In Catalyst Connection's 2018 Manufacturing Employment Demand Study, the 111 companies responding indicated that they had 1,070 to 2,300 current open positions. Of these one-third were entry-level and did not require a college degree. This 2021 analysis is of a small number of employers

and only for entry-level positions. A review of the number of jobs per company in 2018 and 2021 suggests that even more entry-level workers will be hired in 2021 than in 2018 if the responding companies are representative of all companies.

Most manufacturers (59%) pay entry-level employees in the \$15-20/hour range. This result corresponds to national data. The remainder (41%) pay \$10-14/hour and some are considering increasing their wages to attract more applicants to their open positions. No companies paid less than \$10 or more than \$20 per hour (the U.S. and PA minimum wage is \$7.25/hour). In some cases, companies in both ranges provide productivity bonuses to all employees on quarterly and/ or annual basis.

All companies provide at least health benefits, but there is variation on other benefits provided such as dental, vision, life insurance, short-term and longterm disability, and 401(k) programs. One challenge several companies reported was that potential entry-level hires compare only the hourly wages they receive and do not incorporate the other benefits companies might offer such as profit-sharing bonuses or retirement funds. This is perhaps not surprising given that most entry-level employees tend to be younger and so may worry less about benefits than mid- and senior- level workers.





H6. Please expand on what benefits you provide in addition to the hourly wage. (more than one may be checked)

Figure 8: Benefits Provided to Entry-Level Workers for 28 Manufacturing Company Respondents

The same may be true for other considerations such as the ability of entry-level employees to advance to higher-level positions, though most companies do provide those opportunities. One noted that their CEO began as an entry-level production worker and gradually rose through the top of top of the company.

H7. Are entry-level employees able to advance to higher-level positions at your company? 28 responses



Figure 9: Percentage of 28 Manufacturing Company Respondents Where Entry Level Employees are Able to

An insufficient number of applicants and a lack of qualified applicants are the primary challenges manufacturers face when hiring for entry-level positions. Low wages, better offer packages, and shift work requirements are the prime reasons those offered positions I the manufacturing industry turn them down. Shift work requirements are particularly challenging given the nature of manufacturing when production demands may require afternoon, evening, and weekend shifts. One company noted that they have enough production demand for a weekend shift but have not institute it due to the challenges of finding a workforce to support it. Non-manufacturing job tend to offer more daylight hours that most workers prefer.



Other issues addressed in the survey were the degree to which the entry-level positions were "Opportunity occupations" and the number of companies that had diversity and inclusion policies. Most companies have both opportunity occupations about 40% have diversity and inclusion polices. Those results are shown be-low:



Figure 10: Reason Prospective Employees Turn Down an Employment Offer for 28 Manufacturing Company Respondents

H12. When it comes to hiring, what are your top five challenges?



Figure 11: Top hiring challenges for 28 Manufacturing Company Respondents

H9. Partner4Work defines "opportunity occupations" as those that "jobs that pay at least \$15/hour and, generally, are accessible to job seekers with...s would you classify as "opportunity occupations"? 28 responses



H10. Does your company have a diversity and inclusion policy for its hiring practices? 27 responses





The last question asked in this section regarded ideas the companies might have as to how Catalyst Connection might help them in hiring their technical workforce. Ideas included:

- "I would like to work with more schools to get students in the workforce and learn on the job training. If Catalyst could help find ways to make this possible and help with cost, I think it would be successful."
- "Providing research and data that I could use to persuade and influence the BOD that changes need to be
- made to our pay structure in order to remain competitive. Access to financial modeling software that shows the overall impact of changes in pay to the budget."
- "Post our open positions, bring possible candidates to tour our facility."
- "Encourage/educate those who apply to open positions to return phone messages, show up for interviews,
- and or be law abiding citizens. My apologies for the sarcasm, but we are having a difficult time filling just one position in our Shipping department."
- "Perhaps help set up a job fair with numerous surrounding schools. We find ourselves having difficulty
- getting in contact with the appropriate people at all the area schools. We spend more time playing phone tag than anything and we end up not getting any potential candidates for our apprenticeship program because the school official isn't fully invested in helping."

Several companies indicated that they were interested in better understanding how Catalyst Connection could assist them with their hiring efforts.



Training Expectation and Needs

All companies provide some degree of on-the-job training related to the specific position along with general training on safety and quality. Some companies assign mentors or have coaches to support new employees as well as monthly safety training. Others have employees train in different departments or train them for all positions on the manufacturing floor. A few companies offer additional training opportunities to those employees interested in learning additional skills such as lean manufacturing or cultural fit training to promote the employee's success.

Companies had mixed views on the importance of pre-employment training in the hiring of entry-level workers. Many commented though on the importance of basic math and measurement skills as well as familiarity with hand tools like hammers, screw drivers, and tape measures.





Figure 14: Importance of Pre-Employment Training in Consideration of an Individual for Employment for 28 Manufacturing Company Respondents For some companies' basic technical, mechanical, and electrical skills were important depending on the nature of the business. Soft skills such as attendance, timeliness, and work ethic are viewed as equally important, sometimes even more important, than technical skills. As indicated by one company, if you can assemble a hamburger, I can teach you to assemble our products. But as another said, "How long does it take to learn common sense?." These results are very similar to those in the 2018 Catalyst Connection employment demand study.

T3. What technical training would make you more likely to hire someone at the entry-level who has no or limited previous work experience? (More than one can be checked.) ^{28 responses}







T5. What soft skills training would make you more likely to hire someone at the entry-level who has no or limited previous work experience? (More than one can be checked.) ²⁷ responses



Figure 16: Importance of Different Soft Skills Training in the Decision to Consider an Individual for Employment for 28 Manufacturing Company Respondents

Some illustrative comments from manufacturers regarding their training needs include:

Technical Skills

- "The generic CNC training is normally not sufficient for individuals to work on different machines. I believe that normal CNC training with a specialization on FANUC controls would be very beneficial. Also, more
- companies are moving from 2 or 3 axis machining to 5 axis machining so that would also be beneficial.
 Also, the wage demands from individuals who have a certificate for machining should not be at the \$18 \$20 per hour that many expect when they apply for a position."
- "Any CNC Experience no defined pre-employment requirements at this time."
- "We look for folks who have familiarity with tools either through previous work, hobbies or technical
- programs."
- "Machinist or electronics training are the most useful for us."
- "We are a specialized industry which we find it hard to fill certain positions. We need to train people to prepare
- for the succession of our current employees. If applicants had the basic training for all that are checked above it would help to facilitate their on-the-job training."

Soft Skills



- "Our biggest issue is work ethic. Many of our entry level folks find it difficult to come to work. Either they don't make it through the probationary period due to poor attendance/tardiness or they burn through their generous PTO days and receive disciplinary write ups for taking time they don't have."
- "We need dependable, team players for our facilities. This includes people that come to work on time with few
- call offs."
- "Candidates need to be coachable, and fully learn company specific tasks before trying to change things."
- "We have very niche products so we always have to do company specific training and a lot of it! These soft skills are very helpful to start with."
- "We need team members who want to work and grow with our company."

The Industrial Manufacturing Technician (IMT) Pre-Apprenticeship helps high school students begin a pathway to a career in manufacturing. Due to changing manufacturing technologies, entry-level workers require higher skills

than before, and employers are struggling to recruit and retain these types of workers. Among the topics covered in the online curriculum are safety, blueprint reading, basic measurement precision measurement tools, dimensional gauging, quality systems, control charts, statistical process control, and continuous improvements. The need for this program was supported by the survey respondents – almost all of whom indicated that they were be interested in, or would at least consider, working with Catalyst Connection in partnership with local high schools in their vicinity, on this program. This might include activities such as touring of their facilities, interviews of students upon graduation, and other support. Figure 17 provides the survey responses and Figure 18 shows the location of the responding companies in relation to their local high schools.

T7. Catalyst Connection's Industrial Manufacturing Technician Pre-Apprenticeship program helps high school students begin a pathway to a career...a greater chance of employment at your company? ^{28 responses}



Figure 17: Interest of 28 manufacturing Companies Responding to Survey in Considering Applicants from Catalyst Connection's Industrial Manufacturing Technician Pre-Apprenticeship Program





Figure 18: Map of Companies in Catalyst Connection Survey (in green) with regional high schools (in red).

On the issue of diversity and hiring, most companies would be willing to consider diverse candidates regardless of the financial incentive as shown in Figure 19. In chatting with the companies, several emphasized diversity in their area there is less ethnic diversity (for example) as much as economic diversity, such as individuals whose income is below the poverty line. Concepts such as using funds to provide a financial bonus to mentors or providing inexpensive transportation options had support and fit in with some company's existing practices. Challenges in the use of these funds included a lack of desire for time spent on

paperwork to participate in the program, and the company would need to also consider the impact of some support options on the attitudes of existing employees.

T9. Would your company consider hiring a diverse candidate (e.g., race, ethnicity, gender, religion) with a high school degree but no previous manufact...cking with a supervisor and will get back to us.) ²⁷ responses



Figure 19: Interest of 28 Manufacturing Companies Responding to Survey in Economic Incentives for Participation in Diversity Program



In terms of training options, most of the companies that are interested in training prefer a mix of classroom and online. And important considerations from their perspective is keeping training short so that it could be managed between shifts and relevant to the specific activities at their company as opposed to more general training. The number of hours of training was less important than the focus of the content within the course to the company's day to day needs.

T13. If your company were to work with Catalyst Connection on training for your current technical workforce, what delivery mode is preferable? 25 responses



Figure 20: Training Delivery Mode Preferences of 28 Manufacturing Companies Responding to Survey For those companies that already participate in Catalyst Connection's educational programs, all found the programs beneficial. During the additional discussions with companies, several indicated that Catalyst's programs for incumbent employees was particularly useful in supporting the advancement of production workers to supervisors. So as good workers move from the production line to supervision of that production line, Catalyst Connection

programs help those individuals learn people management skills as well as new technical skills such as blueprint reading.

T15. Overall, if you are currently involved with a Catalyst Connection training program, how would you assess the organization's performance?



Figure 21: Assessment of Catalyst Connection's Existing Training Programs by the 28 Companies Responding to the Survey



Future Manufacturing Workforce Job and Hiring Projections

The results of this survey of SWPA Manufacturers are similar to those at the national level as discussed in a May 2021 Deloitte study, Creating pathways for tomorrow's workforce today. Provided below are some key results from a survey of 800 US manufacturers conducted from December 2020 to February 2021 along with Deloitte analyst projections. Some key findings excerpted from the study:



Figure 22: Share of Open Positions Challenging for Manufacturers to Fill (Deloitte, 2021)

Figure 23: Projected Manufacturing Middle-Skill Occupation Openings, 2019-2029 (Deloitte)

• "Many manufacturers can't fill entry-level production associate positions. These are the jobs that do not require technical know-how or industry knowledge, such as team assemblers, production work helpers, and hand-held tool cutters and trimmers. Rather, they require a person who has a basic level of "human capabilities," such as following directions, willingness to learn, and follow-through."

"In fact, US manufacturing executives surveyed believe that finding the right talent is now 36% harder than it was in 2018. As one executive worried, "Is there a point when we run out of production workers or a point when we have to consider moving to a different location?"

• "Manufacturers increasingly have difficulty filling middle-skill jobs. These jobs typically require some level of technical training or applied skills. Examples include computer numerical control (CNC) machinists, welders, and maintenance technicians. At the higher end of experience, some of these jobs require more specialized skills. Unlike the first category, these jobs cannot typically be filled immediately with someone from another industry or recently graduated from high school. Rather, they often require a hands-on, applied training program that can take between several months to more than a year. Some also require licensing and certification."

"As digital transformation in the manufacturing industry continues to develop, the skills needed to do the
jobs in the smart factory will likely be different than skills used today. But today's manufacturing workforce doesn't possess many of these skills. And, without making changes to the skills composition of the
workforce, manufacturers could leave up to 2.1 million jobs unfilled between 2020 and 2030, impacting
everything from productivity to innovation and competitiveness to GDP."



So, why are these manufacturing shortages occurring despite high unemployment rates caused by the pandemic? According to Deloitte, there are a number of reasons:

 Today's manufacturing workforce has worklife balance expectations that do not fit well with the nature of the manufacturing industry. As stated in the Deloitte study:

"The 2020 Deloitte Global Human Capital Trends study identified well-being as a top trend, cited by 80% of respondents across industries. There are a number of aspects to an employee's well-being, and one major component is work/ life balance. In the manufacturing industry, work/life balance is the number two priority behind "attractive income/pay" when respondents choose where to work. However, it is also the top area where respondents believe manufacturers fall short, and work/life balance is the top reason that respondents are considering leaving the manufacturing industry. For an industry that needs to attract new entrants from other places, manufacturers likely have to address this disconnect between what workforce entrants want and the way manufacturing work is structured."

FIGURE 4

An estimated 2.1 million open positions may prove difficult to fill by 2030



2. For middle-skill jobs (e.g., machinists, technicians, welders) or those in entry-level positions hoping to move into middle-skill jobs, pay is too low for workers to relocate to where the jobs are available due to the financial challenges of moving. So, manufacturers must find applicants for middle-skill positions locally rather than nationally. This leads to competition among manufacturers in the region for a limited pool of middle-skill workers. As stated in the Deloitte study:

"The challenge in this case is providing available preemployment training in the same locations where there is demand and available workforce, the ability of in-market resources to match the two, and the successful program completion that could take several months to more than a year to complete, often without pay."



Possible Options for Action to Respond to Workforce Shortages

The Deloitte study recommendations align well with the interests of SWPA manufacturers per the findings of this study. Deloitte recommends actions such as the following that involve engaging, involving, and evolving potential new sources of talent (See Figure 11).

In the "Engage" category, for example, Deloitte proposes "Consider launching efforts at the high school level to connect with local youths and build awareness of the promising careers that exist in manufacturing, including attractive pay."

Almost all of the survey and focus group respondents indicated that they would be interested in participating in Catalyst's existing pre-apprenticeship program that involves high school students learning skills

online and expanding it with visits to manufacturers in close approximation to their regional high schools. This proposed action is also in line with Deloitte's other "engage" proposal for enhanced community engagement by manufacturers based on the finding that "Companies that have built strong relationships within the community and fostered a connection between employees' work and their lives outside the walls of the factory have reported a better ability to attract new job candidates for entry-level positions." Other proposed actions by Deloitte to attract entry- level workers include:

- Providing more flexible options for shift workers to enhance work/life balance options.
- Utilizing cobots and autonomous material movers, which manufacturers indicate could fill 16% of open jobs.

Both of these options are likely to be more challenging to implement than pre-employment training programs.

FIGURE 12

A framework to address workforce challenges



Figure 25: Deloitte Framework to Address Workforce Challenges (Deloitte)



Conclusion

As is the case nationally, manufacturing employment in Southwest Pennsylvania is on an upward trend as the nation recovers from the pandemic economic slump – though it has not yet quite reached pre-pandemic employment levels. We are beginning to see the same technical workforce shortages as occurred prior to the pandemic, leading to the need for higher wages so the manufacturing industry can compete not only with other manufacturers but other economic sectors.

Continued support from Catalyst Connection to support the hiring needs of small- and medium-sized manufacturers through its training programs is as important today as it was prior to the pandemic. For example, Catalyst could bring the companies in each region to partner with high schools to offer tours of manufacturing facilities and other programming so that high school students had a better understanding of today's manufacturing employment opportunities and how they differ from those in the past. According to the Deloitte study, one of the top reasons these positions tend to go unfilled is that "new entrants lack of attraction or interest in the industry," leading to the need for more education of the younger generation about the manufacturing industry.

Catalyst has a number of programs to encourage student and recent graduate interest in manufacturing positions. (See Figure 26). These include its "What's So Cool About Manufacturing" video contest that is popular with both participating manufacturers and students. Students can, with the support or regional manufacturers, continue through their interest through the IMT Pre-Apprenticeship program. High school graduates could then work through The Making Your Future program to find manufacturing jobs in their region.

Figure 26: Catalyst Connection Education and Training Programs and Activities



Appendix A Participating Companies

Catalyst Connection would like to sincerely thank the following Southwest Pennsylvania companies that took time out of their busy schedules to participate in the survey, interviews, and focus groups that provided the data for this report.

Allegheny County

Alpine Packaging, Inc. Angstrom Sciences BRUSH Americas Clark Precision Machined Components Diamond Wire Spring Company DMI Companies (also in Washington County) Foerster Instruments Inc. Highway Equipment J.V. Manufacturing Co., INC. Kurt J. Lesker Company ProMinent Fluid Controls RE2 SMS (also in Washington County) The Acutronic Company

Armstrong County Kensington HPP, Inc

Beaver County c3controls O'Neal Manufacturing Services Ptc Alliance

Butler County Du-Co Ceramics Company Fayette County Heartland Fabrication, LLC TSItouch Inc Fayette County Heartland Fabrication, LLC TSltouch Inc

Indiana County H&W Global Industries, Inc.

Somerset County DeVilbiss Healthcare LLC (Drive DeVilbiss Healthcare)

Washington County Aquatech

DMI Companies (also in Allegheny County) Ensinger Rose Plastic Schroeder SKC, Inc. SMS (also in Allegheny County)

Westmoreland County

Gibson Stainless & Specialty, Inc. Intervala, LLC Product Evaluation Systems, Inc. Stellar Precision Components, LTD Universal Plastics



Appendix B

Demographic Information on Participating Companies

Provided below is demographic information from the companies that responded to the survey (only). It does not include companies that only participated in the focus group.

Notes:

- The name of companies participating by county is in Appendix A.
- All companies indicated they are in the Manufacturing SIC code (2000-3999)
- All companies are in the NAICS Manufacturing Code (31-33) with one in construction (23). Companies were in different NAICS specific codes with no overlap.
- Most, but not all, companies provided the information below.

D2. How many people are employed by your company in your Southwest PA locations? (as defined above)

28 responses



D7. For what sectors does your company produce products? (More than one may be checked.) ²⁷ responses

